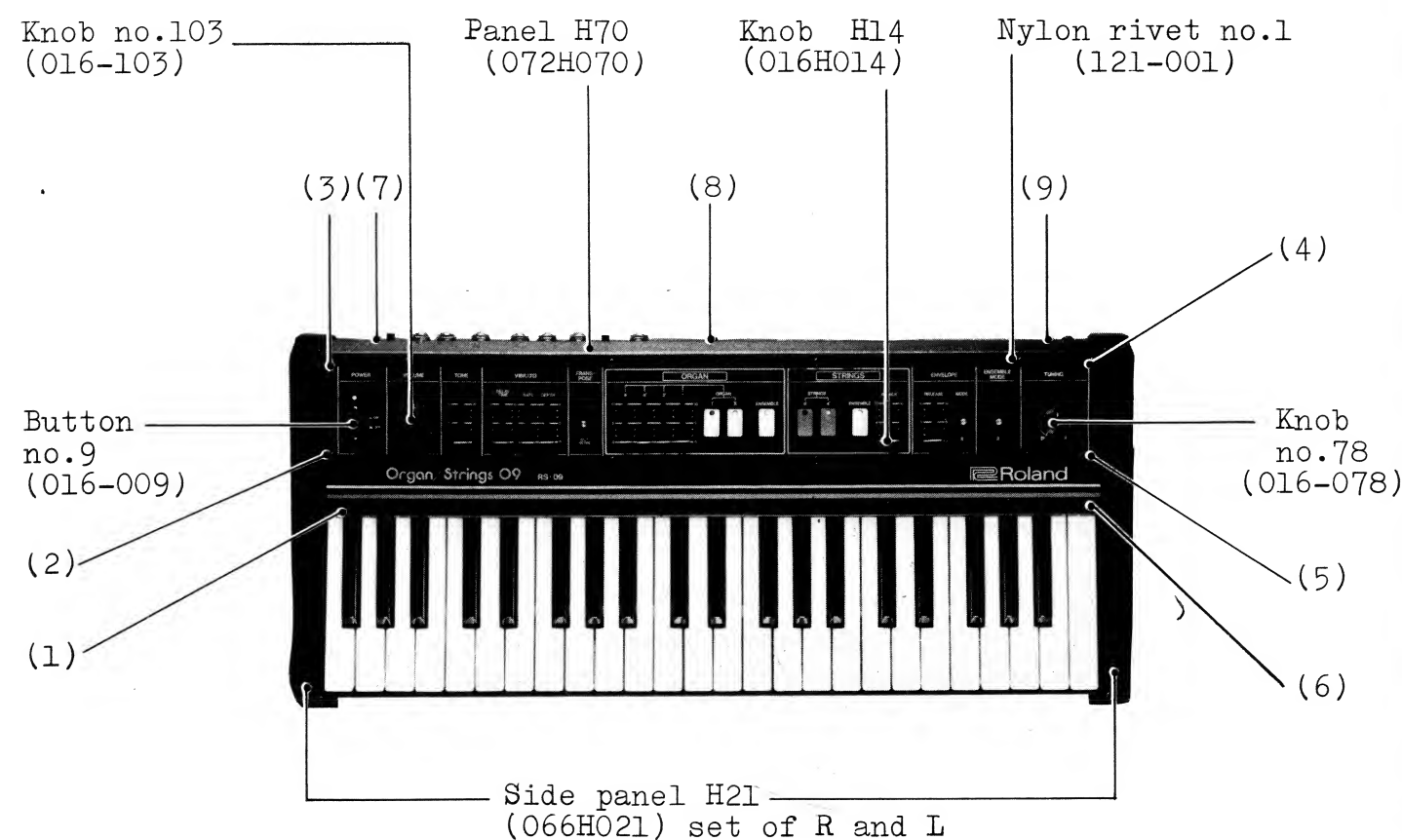


# RS-09 SERVICE NOTES

Second Edition

**APPLICABLE TO SERIAL NUMBERS with 947450 and SUBSEQUENT**  
(Guide on design change, pages 2, 3.)

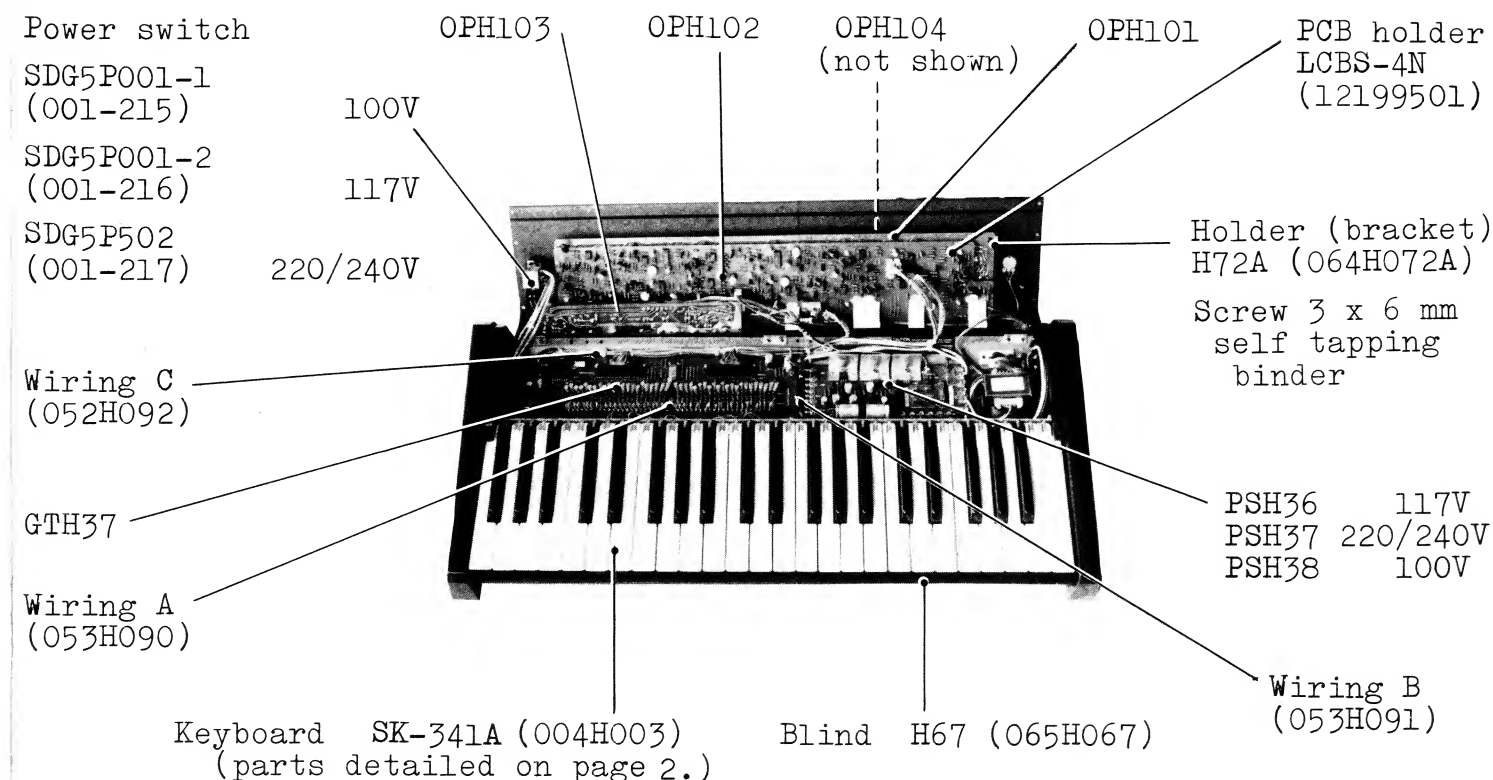
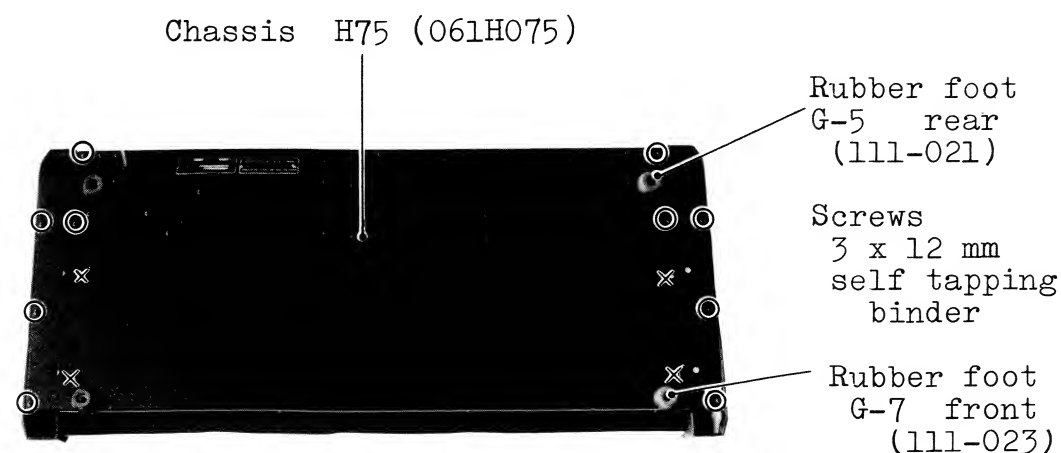


Top cover removal screws

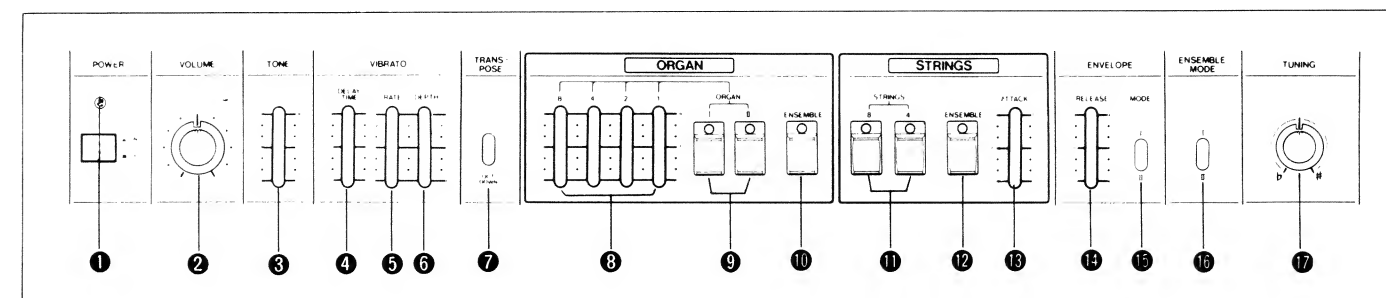
- (1) through (6) 3 x 10 mm tap-tight binder Br  
(7) through (9) 3 x 6 mm self tapping binder Br

Side panel removal screws (encircled)  
3 x 10 mm tap-tight B binder Br

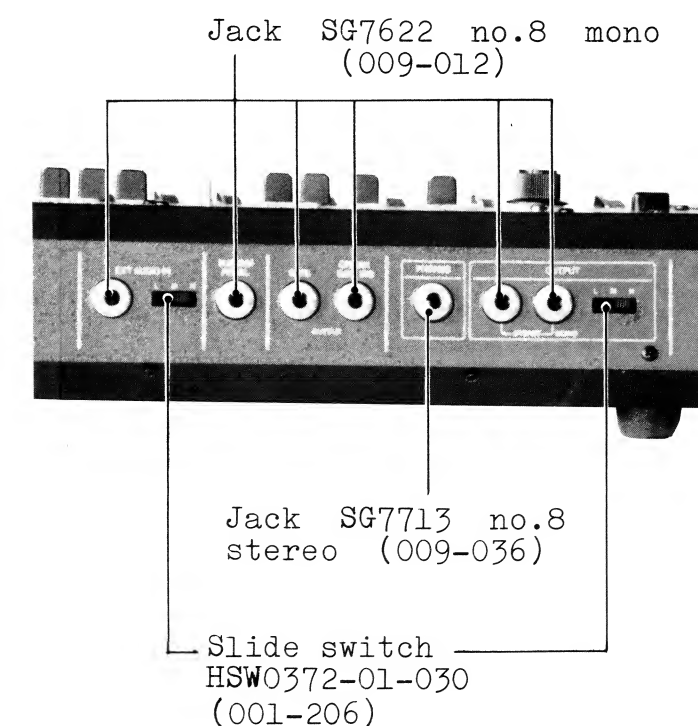
Keyboard removal screws (crossed)  
5 x 16 mm self tapping binder Br



WHEN ORDERING CIRCUIT BOARD, SUFFIX alphabet to the part name, if any.



- |     |                 |           |            |
|-----|-----------------|-----------|------------|
| 1   | TLR-124         |           | (019-028)  |
| 2   | GM70RK20A14P    | 10KA x 2  | (026-010)  |
| 3   | MFE9R-C16A15    | 100KA x 2 | (029-416)  |
| 4,5 | LFE9R-C16A15    | 100KA     | (029-306)  |
| 6   | LFE9R-C16B14    | 10KB      | (029-314)  |
| 7   | SLE-622-18PS    |           | (001-268)  |
| 8   | LFE9R-C16B14    | 10KB      | (029-314)  |
| 9   | Tablet          |           |            |
| 10  | H17             | yellow    | (016H017)  |
| 11  | H10             | white     | (016H010)  |
| 12  | H13             | blue      | (016H013)  |
| 13  | H10             | white     | (016H010)  |
| 14  | Switch KHC11901 |           | (13129712) |
| 15  | LFE9R-C16A16    | 1MA       | (029-309)  |
| 16  | LFE9R-C16B15    | 100KB     | (029-317)  |
| 17  | SLE-622-18PS    |           | (001-268)  |
| 18  | EVHCOAK15B15    | 100KB     | (026-005)  |



PARTS LIST

GUIDE on DESIGN CHANGE

Major differences in circuit configuration, and components and their arrangements between versions.

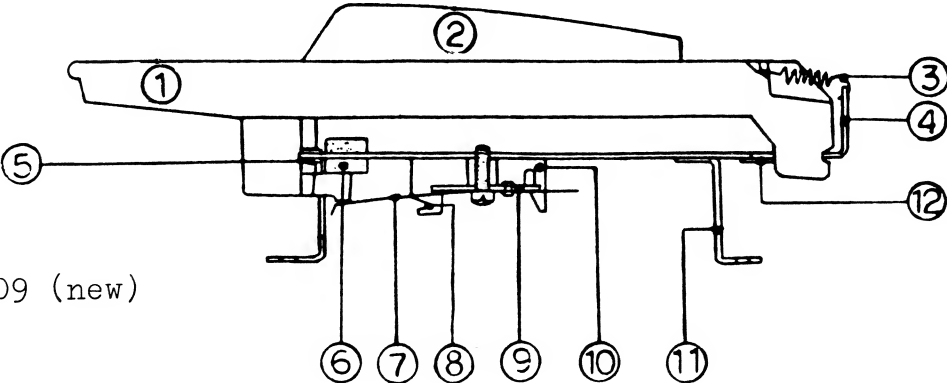
SELECT SWITCH (ORGAN I, II)	Rocker (Changeover switch)	S/N with 947450
		Key with LED (Independent)(OPH104)
KEYBOARD	SK-141A	SK-341A
MODULATION (Bias Adjust)	BBD SAD512 (Common to four)	BBD MN3004 (Individual)
SUSTAIN PEDAL CLICK NOISE	. . .	Q317, Q318 (OPH102) Reduction circuit
STRINGS VCA BALANCE	. . .	PM301 (DC adj.)
MUTING CIRCUIT	. . .	Q331-333 (OPH101)
PHONE AMP	OPH45, OUTPUT BRD.	OPH101, CONTROL BOARD

Prior to above, power transformers have been changed to those which deliver 2 volts lower secondary output at full load for less heat dissipation. - 23V to 21V DC -

NOTES: "*" : indicates parts first introduced into RS09 from serial number 947450, or parts different from those on the parts list of previously issued (DEC. 15, 1978) Service Notes. Of above, followed by "***" can replace predecessors.			POTENTIOMETER		
PANEL. CASING			026-005	EVHCOAK15B15	100KB TUNING
*072H070	Panel (top)	H70	026-010	GM70RK20A14P(L)	10KA x 2 ganged, VOL
066H021	Sidepanel	H21 set of R and L	029-314	LFE9RC16B14	10KB slide
061H075	Chassis	H75 (main)	029-306	LFE9RC16A15	100KA slide
111-021	Rubber foot	G-5 rear	029-317	LFE9RC16B15	100KB slide
111-023	Rubber foot	G-7 front	029-309	LFE9RC16A16	1MA slide
			029-416	MFE9RC16A15	100KA x 2 slide, TONE
			*030-465	SR19R	10KB trimmer
			*030-471	SR19R	100KB trimmer
			045-024	Resistor	3.3K-ohm carbon 1/2w
			SEMICONDUCTOR		
			Transistor		
*004H003	Keyboard	SK341A	*15119805	2SB834-0	
			*017-105	2SA1015-Y	
			*017-139	2SD880-0	
			*017-012	2SA733-	Q or P
			*017-013	2SC945-	Q or P
			017-016	2SK30A-	GR or Y
			Diode		
			*018-075	05Z5.1L	zener
			018-035	05Z5.6U	zener
			018-014	1S2473	
			018-094	1S2473FV	vertical mount
			018-089	1B4B41	rectifier bridge
			*019-028	TLR124	LED
			IC		
			020-191	S10430	divider keyer
			020-156	AY-3-0214	chromatic divider
			020-041	TC4013BP	
			020-097	uPC4558	
			020-160	BA662A	
			020-080	HA1457	
			*15159124TO	TC4093BP	
			*020-063	MN3004	BBD
			*020-224	MN3101	BBD driver
			*020-083	TC4016BP	
			CONNECTOR. TERMINAL. CABLE		
			Wafer Terminal		
			*010-188	5045-08A	010-185 5045-07A
			010-183	5045-03A	010-193 5046-03A
			010-186	5045-05A	*010-194 5046-04A
			Wiring Assembly		
			*053H090	A	*053H092 C
			*053H091	B	*053H093 D, E
			053H030	Flat cable H30	PCB-PCB
			053H031	Flat cable H31	
			*053H083	Flat cable H83	PCB-MWP
			*13439509	Connector MWP 5P-1B	flat cable
			OTHERS		
			065H050	Dust cover H50	slide sw/pots. jack
			048-001	Heat sink	no.1
			120-014	Long nut(spacer or stand off)	no.14 3 x 6 mm
			120-009	Long nut	no.9 3 x 13 mm
			*120-042	Long nut	no.42 3 x 8 mm
			064H072A	Holder H72A	bracket-OPH101
			064H076	Holder H76	LED
			121-001	Nylon river	no.1
			*12199501	Pcb holder	LCBS-4N
			*Some components are called out in new numbering.		
TRANSFORMER (WINDING)					
*022H021J **	PT-H21J	100V			
*022H021C-B**	PT-H21C-B	117V			
*022H021D-A**	PT-H21D-A	220/240V			
022-135	Coil	40M-067-018 10uH			
JACK					
009-012	SG7622 no.8	mono			
009-036	SG7713 no.8	stereo			
068-005	Bushing no.5				
121-005	Washer no.5				
FUSE					
008-040	MGP 0.5000 (CSA) prim.	117V			
*008-063	SEMKO T500mA sec.				
	(also 220/240V prim.)				
012-003	Fuse clip TF758 or F-6				
PRINTED CIRCUIT BOARD					
*147H037B**	GTH37B gate (pcb 052H149B)				
*147H101A	OPH101A control (pcb 052H246A-1)				
*149H102A	OPH102A control (pcb 052H246A-2)				
*149H103	OPH103 output (pcb 052H248)				
*149H104B	OPH104B select (pcb 052H247B)				
*146H036C **	PSH36C pwr supply (pcb 052H146C)	117V			
*146H037C **	PSH37C (052H146C)	220/240V			
*146H038C **	PSH38C (052H146C)	100V			
CAPACITOR					
035-320	ECQS1101K 100pF 125V polystyrene				
035-279	ECQS1102K 1000pF 125V				
032-270	1uF/50V electro. M type				
032-275	0.47uF/50V electro. M type				

KEYBOARD PARTS

NO	PART NO	DESCRIPTION	NO	PART NO	DESCRIPTION
1	106H026	Natural key C, F	5	068H004	Guide bushing H4
1	106H027	Natural key D	6	101H141	Level felt H141
1	106H028	Natural key E, B	7	071H044	Contact leaf H44
1	106H029	Natural key G	8	071H047	Bus bar 44p H47
1	106H030	Natural key A	9	043H007	Switch unit 12p H7
1	106H031	Natural key C', F'	9	043H006	Switch unit 8p H6
2	106H032	Sharp key black	10	104H029	Busbar holder H29
3	070H029	Key spring H29	11	062H024	Chassis bracket H24
4	061H084	Chassis H84	12	098H006	Key stopper H6



## PRINTED CIRCUIT BOARDS

S/N up to 937449

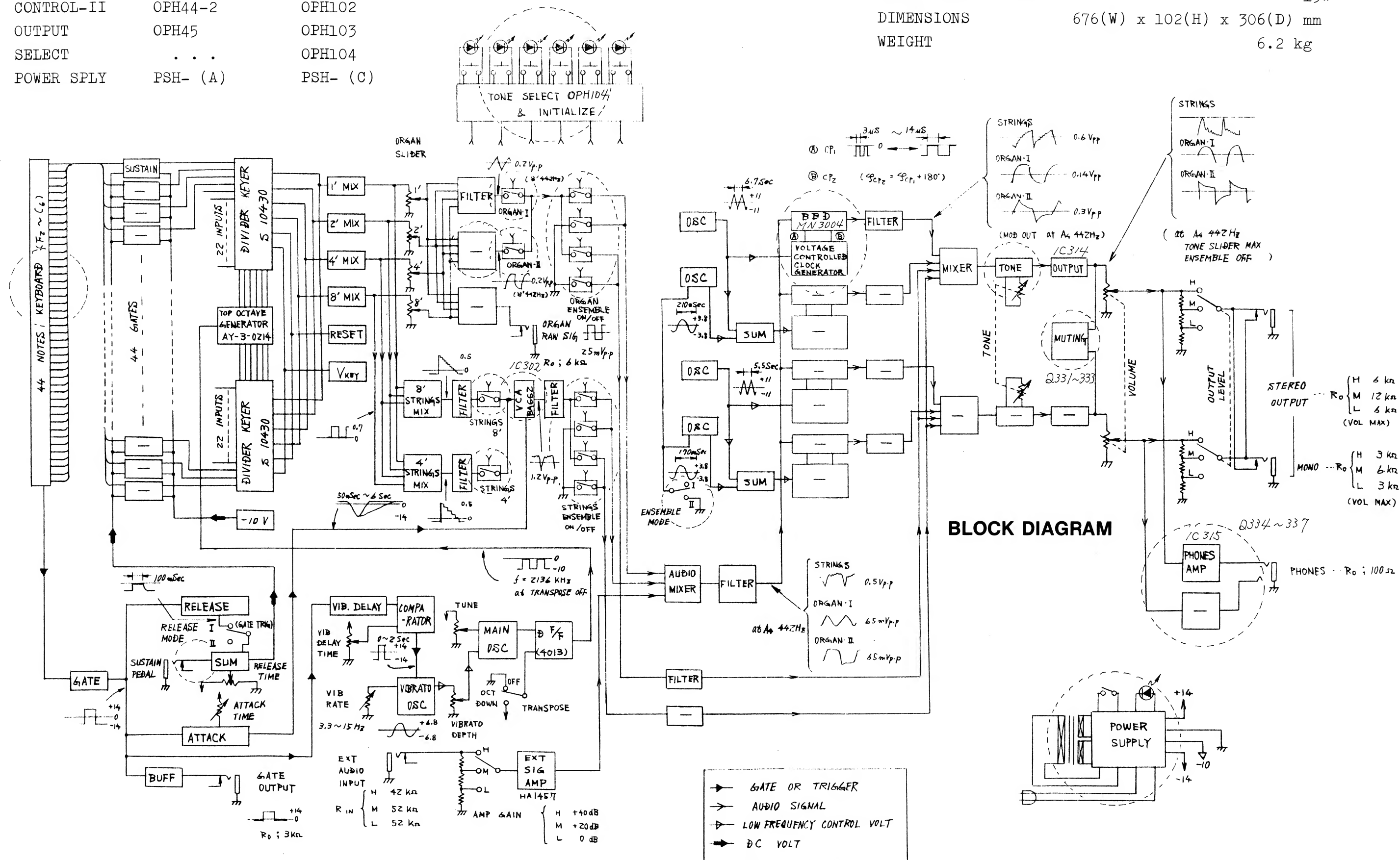
S/N with 947450

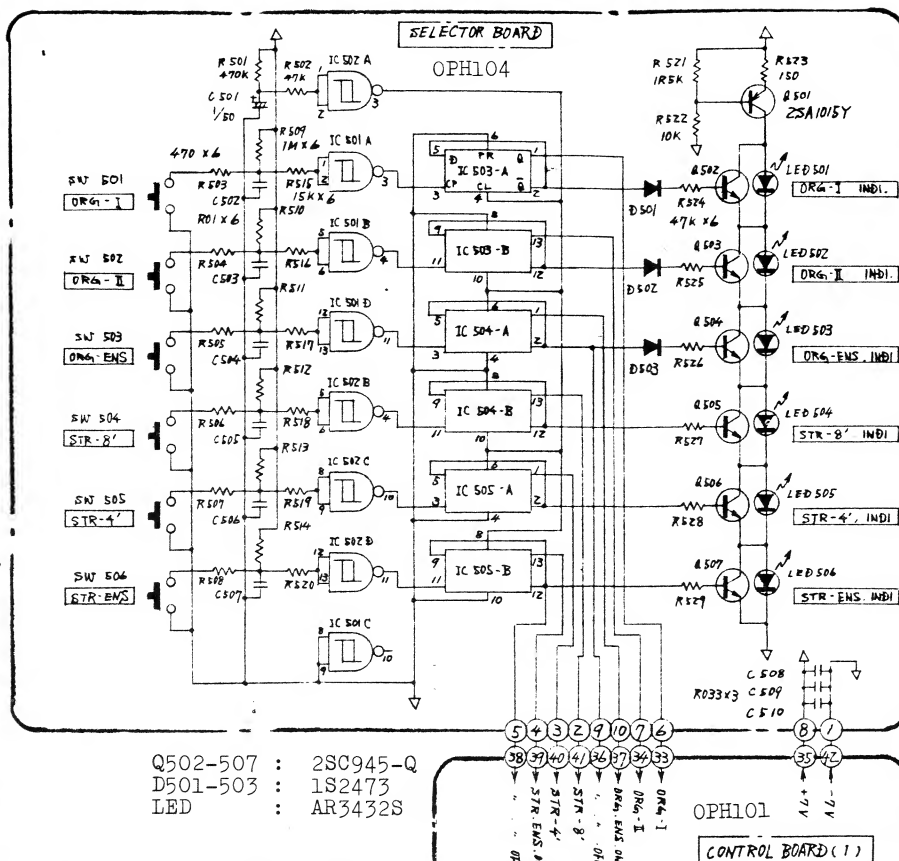
GATE	GTH37(A)	GTH37(B)
CONTROL-I	OPH44-1	OPH101
CONTROL-II	OPH44-2	OPH102
OUTPUT	OPH45	OPH103
SELECT	. . .	OPH104
POWER SPLY	PSH- (A)	PSH- (C)

DOTTED CIRCLES show circuits and parts different from those in previously issued Service Notes, not mentioned in Guide, inclusive.

## SPECIFICATIONS

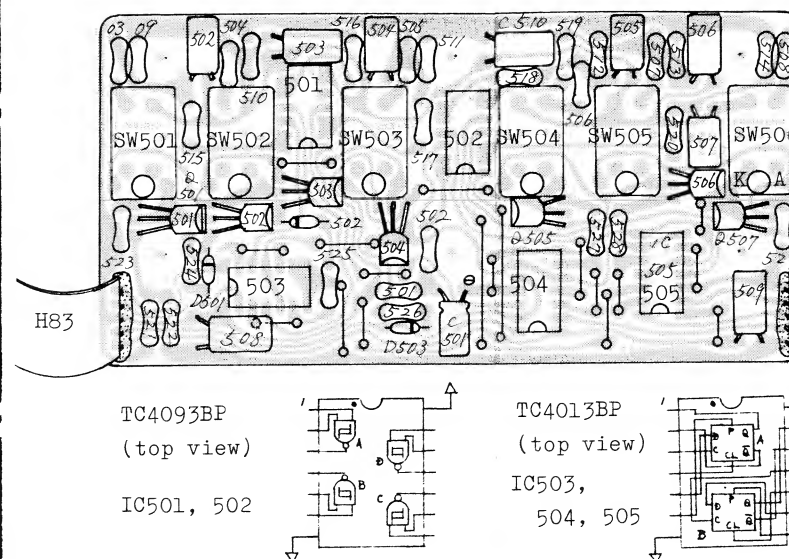
ENVELOPE RELEASE TIME	3.5s	max.
PITCH CONTROLLABLE RANGE	$\pm$ 50	cents
POWER CONSUMPTION		15W
DIMENSIONS	676(W) x 102(H) x 306(D)	mm
WEIGHT	6.2	kg





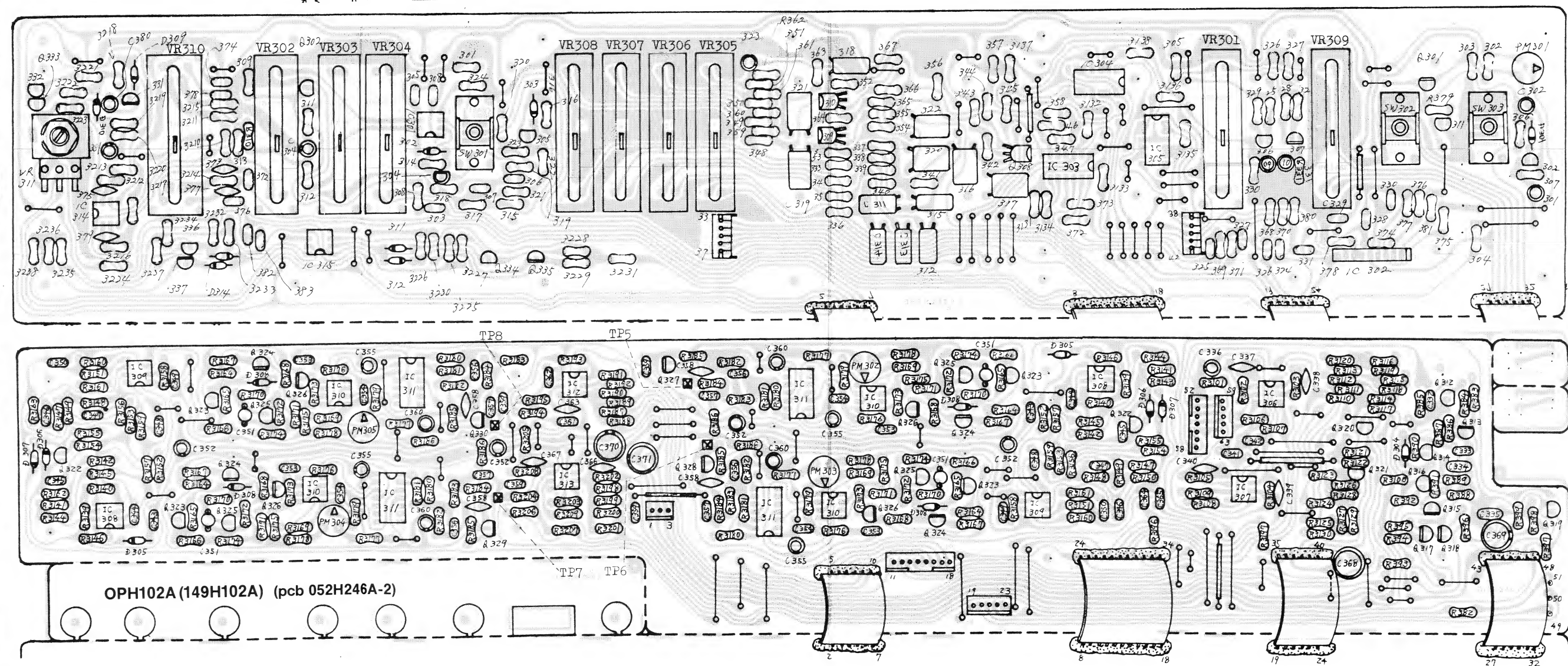
## OPH104B (149H104B) (pcb 052H247B)

View from the foil side



## OPH101A (149H101A) (pcb 052H246A-1)

View from the foil side



## ADJUSTMENT

BBD BIAS - OPH102 -

SETUP

ORGAN/STRINGS ENSEMBLE : off

Input signal : Sine wave, 442Hz, -26dBm into EXT AUDIO IN (level switch, H)

1. Connect oscilloscope to TP5 on OPH102.
2. Adjust PM302 for centering waveform on the screen.
3. Apply similar steps to the other MOD channels:

TP6 - PM303 TP7 - PM304

TP8 - PM305

4. Verify the following:

a) Output level stays constant as the Input signal and the Input Level are set for the following combinations.

INPUT SIGNAL	EXT AUDIO IN
-40dB	H
-20dB	M
0dB	L

- b) Distortion is not appreciable when four keys (in chord)

are played simultaneously with the following

control setting: ORGAN sliders 8', 4', 2', 1' - "10". ORGAN tab - I.

TONE - "10". ORGAN ENSEMBLE - "on"

VCA DC BALANCE - OPH101 - (Strings)

SETUP

Tablet switches: All off

ATTACK: "0"

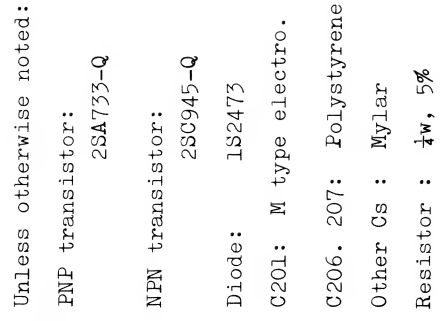
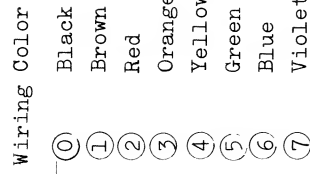
VOLUME: "10"

OUTPUT MONO Jack:

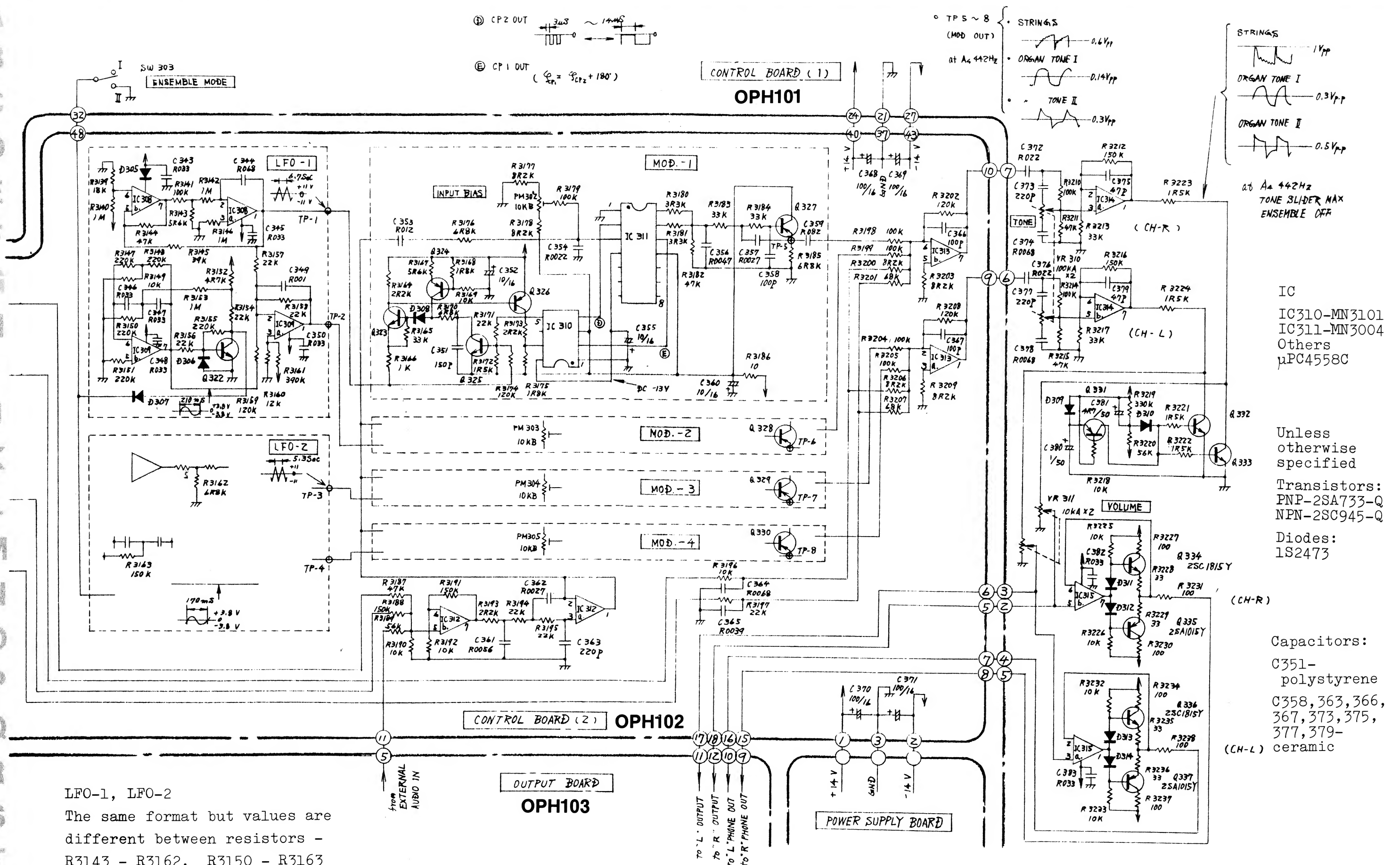
to an amplifier and speaker (Level switch - H)

- a) While tapping a key, adjust PM301 for the least click noise.

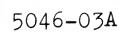
F2	C3	F3	A4	C5	F5	C6
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**View from the foil side**



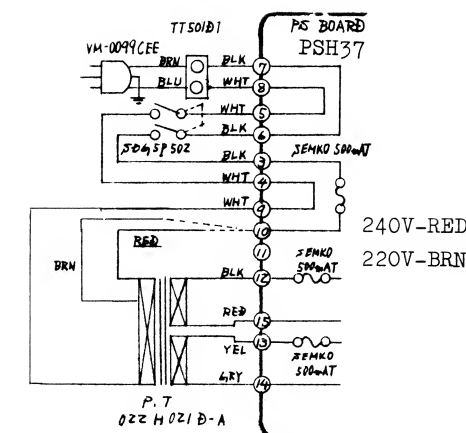
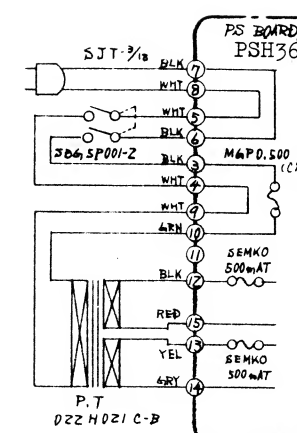
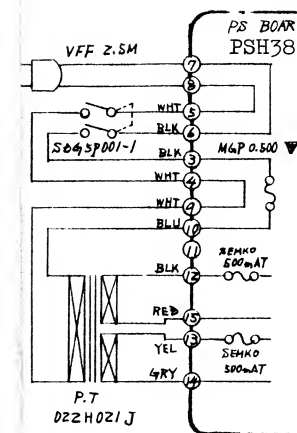
HSW0372-01-030 SG7622 no.08 SG7713 no.08 S G 7 6 2 2 n o . 0 8 HSW SG7622 no.08  
0372-01-030



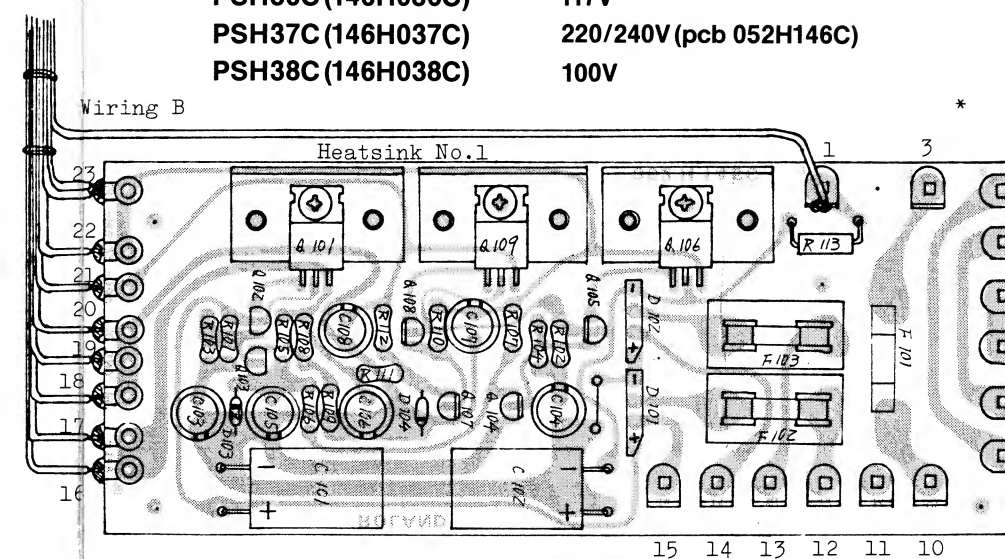
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

## 117V

**220/240V**



117V  
220/240V (pcb 052H146C)  
100V



DIFFERENCE AMONG  
VERSIONS:

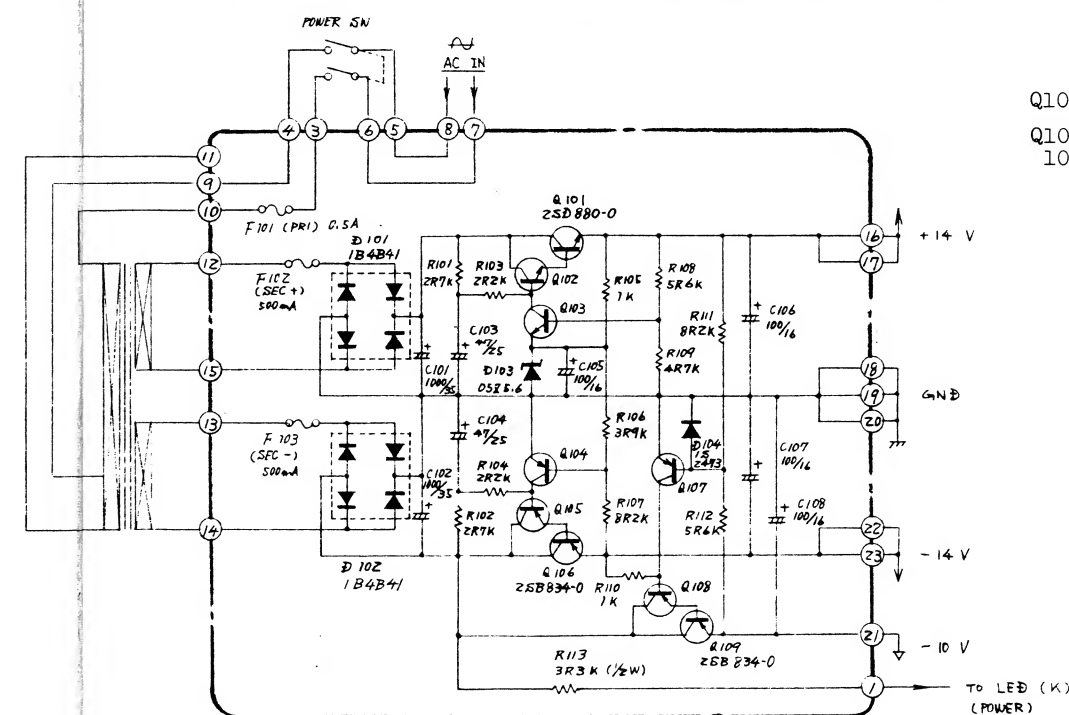
Type of F101

PSH38 - MGP 0.5A

PSH36 - MGP 0.5A  
(CSA)PSH37 - SEMKO  
T500mA

Q102, 103 - 2SC945-Q

Q104, 105, - 2SA733-Q  
107, 108





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